

REMARKS

In the Office Action, the Examiner rejected claims 16-23 and 28-35 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 4,782,193 issued to Linsker (Linkser). The Examiner rejected claims 24 and 36 under 35 U.S.C. §103(a) as being unpatentable over Linsker in view of U.S. Patent 5,635,736 issued to Funaki et al. (Funaki). The Examiner rejected claims 25, 27, 37 and 39 under 35 U.S.C. §103(a) as being unpatentable over Linsker in view of U.S. Patent 6,262,487 B1 issued to Igarashi et al. (Igarashi). In this Amendment, Applicants have amended claims 16, 18, 22, 25, 27-28, 30, 34, 37 and 39. Applicants have also canceled claims 20 and 32, and have added new claims 40-50. Applicants have not cancelled, added, or amended any other claim. Accordingly, claims 16-19, 21-25, 27-31, 33-37, and 39-50 will be pending in the Application upon entry of this Amendment.

I. Rejection of Claims 16-19, 21-25 and 27

The Examiner rejected claims 16-19 and 21-23 under §102(b) as being anticipated by Linsker. The Examiner further rejected claim 24 under §103(a) as being unpatentable over Linsker in view of Funaki. The Examiner also rejected claims 25 and 27 under §103(a) as being unpatentable over Linsker in view of Igarashi.

Claims 17-19, 21-25 and 27 are dependent on claim 16. Claim 16 recites an integrated circuit (IC) that has metal layers with conductors to interconnect components in the IC. The metal layers have a first metal layer group with at least one metal layer and a second metal layer group with at least one metal layer. The metal layer in the first metal layer group has at least one self-contained layout section with conductors deposited in a preferred Manhattan direction. A preferred direction is a direction for at least fifty percent of conductors, relative to the IC boundaries. The self-contained layout section has a routing of conductors developed independently from the routing of conductors for circuits outside the self-contained layout

section in the IC. The self-contained layout section comprises a section that is less than the entire area of the metal layer in the first metal layer group.

The metal layer in the second metal layer group has conductors deposited in a preferred diagonal direction in a portion of the metal layer in the second metal layer group directly adjacent to the self-contained layout section. The conductors for the second metal layer group are routed independently from the routing of conductors for the self-contained layout section.

The preferred Manhattan direction conductors of the self-contained layout section within the first metal layer group do not electrically cross-couple with conductors of the second metal layer group regardless of whether the self-contained layout section conductors are deposited in either a horizontal or vertical direction.

Applicants respectfully submit that Linsker does not disclose, teach, or even suggest the IC of claim 16. For instance, Linsker fails to disclose, teach, or even suggest:

- at least one self-contained layout section that has a routing of conductors developed independently from the routing of conductors for circuits outside the self-contained layout section, and that includes a section that is less than the entire area of the metal layer;
- a second metal layer group with a metal layer that has conductors deposited in a preferred diagonal direction in a portion of the metal layer directly adjacent to the self-contained layout section; and
- conductors of the self-contained layout section within the first metal layer group do not electrically cross-couple with conductors of the second metal layer group regardless of whether the self-contained layout section conductors are deposited in either a horizontal or vertical direction.

The Examiner states that an entire plane in Linsker may be self-contained. Applicants respectfully submit that Linsker does not show at least one self-contained layout section that has a routing of conductors developed independently from the routing of conductors for circuits outside the self-contained layout section. Applicants respectfully submit that Linsker only shows horizontal, vertical, and diagonal wiring to connect multiple chip modules using wiring planes in a printed circuit board. Therefore, Linsker does not show a self-contained layout section of an IC as recited in claim 16. To add further force and reasoning to this argument, Applicants have amended the claims to recite that the self-contained layout section comprises a section that is less than the entire area of the metal layer.

Moreover, Linsker does not disclose, teach, or even suggest a metal layer that has conductors deposited in a preferred diagonal direction to prevent electrical cross-talk. Linsker does not disclose that these diagonal conductors are in a portion of the metal layer directly adjacent to the self-contained layout section. Further, Linsker does not disclose that conductors of the second metal layer group do not cross-couple with conductors in the self-contained layout section regardless of whether the self-contained layout section conductors are deposited in either a horizontal or vertical direction. Thus, Applicants respectfully submit that Linsker does not disclose, teach, or even suggest several of the limitations recited in claim 16.

Accordingly, Applicants respectfully submit that Linkser neither anticipates claim 16, nor otherwise renders this claim invalid. As claims 17-25 and 27 are dependent on claim 16, Applicants respectfully submit that claims 17-25 and 27 are also patently distinguishable from Linsker for at least the reasons discussed above for claim 16.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the §102 rejection of claims 16-23 and the §103 rejection of claims 24-25 and 27.

II. Rejection of Claims 28-37 and 39

The Examiner rejected claims 28-31 and 33-35 under §102(b) as being anticipated by Linsker. The Examiner further rejected claim 36 under §103(a) as being unpatentable over Linsker in view of Funaki. The Examiner also rejected claims 37 and 39 under §103(a) as being unpatentable over Linsker in view of Igarashi.

Claims 29-31, 33-37 and 39 are dependent on claim 28. Claim 28 recites a method that deposits metal layers that have conductors to interconnect components of an IC. The method designates a first metal layer group that has at least one metal layer and a second metal layer group that has at least one metal layer. The metal layer in the first metal layer group has at least one self-contained layout section with conductors deposited in a preferred Manhattan direction. A preferred direction defines a direction for at least fifty percent of conductors, relative to the IC boundaries. The self-contained layout section of the metal layer has a routing of conductors developed independently from the routing of conductors for circuits outside the self-contained layout section in the IC. The self-contained layout section comprises a section that is less than the entire area of the metal layer in the first metal layer group.

The metal layer in the second metal layer group has conductors deposited in a preferred diagonal direction in a portion of the metal layer in the second metal layer group directly adjacent to the self-contained layout section within the first metal layer group. The conductors for the second metal layer group are routed independently from the routing of conductors for the self-contained layout section.

The preferred Manhattan direction conductors of the self-contained layout section within the first metal layer group do not electrically cross-couple with conductors of the second metal layer group regardless of whether the self-contained layout conductors are deposited in either a horizontal or vertical direction.

Applicants respectfully submit that Linsker does not disclose, teach, or even suggest the method of claim 28. For instance, Linsker does not show a self-contained layout section that has a routing of conductors developed independently from the routing of conductors for circuits outside the self-contained layout section, as recited in claim 28. Linsker also does not show a self-contained layout section that is less than the entire area of the metal layer in the first metal layer group. In fact, Linsker does not discuss self-contained layout sections. Instead, Linsker shows entire wiring planes and enlarged portions of these wiring planes. Moreover, Linkser does not disclose diagonal wiring on a metal layer in a second metal layer group that is directly adjacent to a self-contained layout section in a first metal layer group such that wires in the self-contained layout section do not cross-couple wires on the metal layer in the second metal layer group, as recited in claim 28. Thus, Linkser does not disclose, teach, or even suggest several limitations of claim 28.

Accordingly, Applicants respectfully submit that claim 28 is patently distinguishable from Linsker for at least the reasons discussed above. As claims 29-37 and 39 are dependent on claim 28, Applicants respectfully submit that claims 29-37 and 39 are patently distinguishable from Linsker for at least the reasons discussed above in relation to claim 28.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the §102 rejection of claims 28-31 and 33-35 and the §103 rejection of claims 36-37 and 39.

III. New claims 40-50.

Applicants have added new claims 40-50. New claims 41-50 are dependent on new claim 40. New claim 40 recites an integrated circuit (IC) that includes several wiring layers and a pre-designed circuit block. The pre-designed circuit block occupies a region on the IC and has wiring on a set of at least two wiring layers. All the wiring to connect internal circuits of the pre-designed circuit block is within the region on the set of wiring layers. A top wiring layer in the

set of wiring layers has a first preferred direction. A second wiring layer that is immediately above the top wiring layer in the set of wiring layers has a second preferred direction that is neither parallel nor orthogonal to the first preferred direction in order to minimize cross-coupling between the second wiring layer and the pre-designed circuit block.

Applicants respectfully submit that none of the cited references disclose, teach, or even suggest such an IC. For instance, none of the references disclose, teach, or even suggest a pre-designed circuit block that occupies a region on the IC where all the wiring to connect internal circuits of the pre-designed circuit block is within the region.

Accordingly, Applicants respectfully request examination and allowance of new claims 40-50.

CONCLUSION

In view of the foregoing, it is submitted that all pending claims, namely claims 16-19, 21-25, 27-31, 33-37, and 39-50, are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance is earnestly solicited at the earliest possible date.

Respectfully submitted,

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